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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,461	02/27/2004	Mamoru Yakushiji	648.43545X00	7834

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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT PAPER NUMBER

1763

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/787,461

Applicant(s)

YAKUSHIJI ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0204</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsukamoto, U.S. Patent 5,868,848.

Tsukamoto shows the invention as claimed including a plasma etching apparatus for etching, comprising: a semiconductor ring 18 disposed on an outer circumference of a substrate W to be processed, and having a bias voltage 43 applied to the ring (see figs. 1-3 and their description).

With respect to the particular type of etching gas, and controlling the bias voltage being applied, the claims are directed to method limitations instead of apparatus limitations. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Tsukamoto is capable of having the claimed etching gasses and controlling the bias voltage.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto, U.S. Patent 5,868,848 in view of Hirose, US 2004/0211518 or Steger, U.S. Patent 5,085,727 or Singh et al., US 2004/0231800.

Tsukamoto is applied as above but do not expressly disclose a resin layer formed of a carbon material disposed on an inner wall surface of a processing chamber. Hirose discloses a resin layer applied to a wall surface to prevent wear to the wall surface (see paragraph 0013). Alternatively, Singh et al. discloses a carbon containing polymer layer 140 in a plasma processing chamber (see fig. 3A and its description). Moreover, Steger discloses a carbon coating formed on inner walls of the processing chamber (see abstract). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Tsukamoto so as to have a carbon material on the inner wall surface of the processing chamber because the chamber can be easily cleaned and protected from long term wear.

Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al., U.S. Patent 6,719,875 in view of Ma et al., U.S. Patent 6,554,954 or Li et al., U.S. Patent 6,506,685.

Ohmi et al. shows the invention substantially as claimed including a plasma etching apparatus, comprising: a ring 107 disposed on an outer circumference of a substrate to be processed, and having a bias voltage applied to the ring (see fig. 1 and its description).

Ohmi et al. does not expressly disclose where the ring is a semiconductor. Ma et al. discloses a ring 52 disposed on an outer circumference of a substrate to be processed from a semiconductor (see fig. 1 and its description, particularly col. 5-lines 4-12). Alternatively, Li et al. discloses a ring 218 disposed on an outer circumference of a substrate 214 to be processed from a semiconductor (see fig. 3 and its description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ohmi et al. so as to construct the ring of a semiconductor because a semiconductor such as silicon is shown to be a suitable material for a ring which surrounds the outer circumference of a substrate to be processed.

With respect to the particular type of etching gas, and controlling the bias voltage being applied, the claims are directed to method limitations instead of apparatus limitations. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as

intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Ohmi et al. modified by Ma et al. or Li et al. is capable of having the claimed etching gasses and controlling the bias voltage.

Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al., U.S. Patent 6,719,875 in view of Ma et al., U.S. Patent 6,554,954 or Li et al., U.S. Patent 6,506,685 as applied to claims 1, 3-6, and 8 above, and further in view of Hirose, US 2004/0211518 or Steger, U.S. Patent 5,085,727 or Singh et al., US 2004/0231800.

Ohmi et al., Ma et al., and Li et al. are applied as above but do not expressly disclose a resin layer formed of a carbon material disposed on an inner wall surface of a processing chamber. Hirose discloses a resin layer applied to a wall surface to prevent wear to the wall surface (see paragraph 0013). Alternatively, Singh et al. discloses a carbon containing polymer layer 140 in a plasma processing chamber (see fig. 3A and its description). Moreover, Steger discloses a carbon coating formed on inner walls of the processing chamber (see abstract). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ohmi et al. modified by Ma et al. and Li et al. so as to have a carbon material on the inner wall surface of the processing chamber because the chamber can be easily cleaned and protected from long term wear.

Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al., U.S. Patent 6,719,875 in view of Nowak et al., U.S. Patent 5,865,896 or Tsukamoto, U.S. Patent 5,868,848.

Ohmi et al. shows the invention substantially as claimed including a plasma etching apparatus, comprising: a ring 107 disposed on an outer circumference of a substrate to be processed, and having a bias voltage applied to the ring (see fig. 1 and its description).

Ohmi et al. does not expressly disclose where the ring electrode is composed of a semiconductor. Nowak et al. discloses an electrode 24 composed of a semiconductor (see fig. 1 and its description). Furthermore, Tsukamoto also discloses an electrode 18 composed of a semiconductor (see figs. 1-3 and their description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ohmi et al. so as to include a ring made of semiconductor because both Nowak et al. and Tsukamoto shows semiconductor to be a suitable material for electrodes.

With respect to the particular type of etching gas, and controlling the bias voltage being applied, the claims are directed to method limitations instead of apparatus limitations. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Ohmi et al. modified by Nowak et al. and

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Tsukamoto is capable of having the claimed etching gasses and controlling the bias voltage.

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Ohmi et al., Nowak et al., and Tsukamoto are applied as above but do not expressly disclose a resin layer formed of a carbon material disposed on an inner wall surface of a processing chamber. Hirose discloses a resin layer applied to a wall surface to prevent wear to the wall surface (see paragraph 0013). Alternatively, Singh et al. discloses a carbon containing polymer layer 140 in a plasma processing chamber (see fig. 3A and its description). Moreover, Steger discloses a carbon coating formed on inner walls of the processing chamber (see abstract). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ohmi et al. modified by Ma et al. and Li et al. so as to have a carbon material on the inner wall surface of the processing chamber because the chamber can be easily cleaned and protected from long term wear.

Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., U.S. Patent 6,232,236 in view of Ma et al., U.S. Patent 6,554,954 or Li et al., U.S. Patent 6,506,685.

Shan et al. shows the invention substantially as claimed including a plasma etching apparatus, comprising: a ring 220 disposed on an outer circumference of a substrate to be processed, and having a bias voltage 242 applied to the ring (see fig. 2 and its description).

Shan et al. does not expressly disclose where the ring is a semiconductor. Ma et al. discloses a ring 52 disposed on an outer circumference of a substrate to be processed from a semiconductor (see fig. 1 and its description, particularly col. 5-lines 4-12). Alternatively, Li et al. discloses a ring 218 disposed on an outer circumference of a substrate 214 to be processed from a semiconductor (see fig. 3 and its description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to construct the ring of a semiconductor because a semiconductor such as silicon is shown to be a suitable material for a ring which surrounds the outer circumference of a substrate to be processed.

With respect to the particular type of etching gas, and controlling the bias voltage being applied, the claims are directed to method limitations instead of apparatus limitations. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as

intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Shan et al. modified by Ma et al. and Li et al. is capable of having the claimed etching gasses and controlling the bias voltage.

Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., U.S. Patent 6,232,236 in view of Ma et al., U.S. Patent 6,554,954 or Li et al., U.S. Patent 6,506,685 as applied to claims 1, 3-6, and 8 above, and further in view of Hirose, US 2004/0211518 or Steger, U.S. Patent 5,085,727 or Singh et al., US 2004/0231800.

Shan et al., Ma et al., and Li et al. are applied as above but do not expressly disclose a resin layer formed of a carbon material disposed on an inner wall surface of a processing chamber. Hirose discloses a resin layer applied to a wall surface to prevent wear to the wall surface (see paragraph 0013). Alternatively, Singh et al. discloses a carbon containing polymer layer 140 in a plasma processing chamber (see fig. 3A and its description). Moreover, Steger discloses a carbon coating formed on inner walls of the processing chamber (see abstract). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Ma et al. and Li et al. so as to have a carbon material on the inner wall surface of the processing chamber because the chamber can be easily cleaned and protected from long term wear.

Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., U.S. Patent 6,232,236 in view of Nowak et al., U.S. Patent 5,865,896 or Tsukamoto, U.S. Patent 5,868,848.

Shan et al. shows the invention substantially as claimed including a plasma etching apparatus, comprising: a ring 220 disposed on an outer circumference of a substrate to be processed, and having a bias voltage 242 applied to the ring (see fig. 2 and its description).

Shan et al. does not expressly disclose where the ring electrode is composed of a semiconductor. Nowak et al. discloses an electrode 24 composed of a semiconductor (see fig. 1 and its description). Furthermore, Tsukamoto also discloses an electrode 18 composed of a semiconductor (see figs. 1-3 and their description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to include a ring made of semiconductor because both Nowak et al. and Tsukamoto shows semiconductor to be a suitable material for electrodes.

With respect to the particular type of etching gas, and controlling the bias voltage being applied, the claims are directed to method limitations instead of apparatus limitations. However, since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Shan et al. modified by Nowak et al. and

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Shan et al., Nowak et al., and Tsukamoto are applied as above but do not expressly disclose a resin layer formed of a carbon material disposed on an inner wall surface of a processing chamber. Hirose discloses a resin layer applied to a wall surface to prevent wear to the wall surface (see paragraph 0013). Alternatively, Singh et al. discloses a carbon containing polymer layer 140 in a plasma processing chamber (see fig. 3A and its description). Moreover, Steger discloses a carbon coating formed on inner walls of the processing chamber (see abstract). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Ma et al. and Li et al. so as to have a carbon material on the inner wall surface of the processing chamber because the chamber can be easily cleaned and protected from long term wear.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luz L. Alejandro
Primary Examiner
Art Unit 1763

November 28, 2005